

Appl. No. 09/811,360  
Amendment dated October 6, 2005  
Reply to Office Action mailed May 12, 2005

Attorney Docket No. 355004-991501

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Previously presented) A total shoulder arthroplasty apparatus for recreating an anatomic proximal humeral configuration, comprising:

a stemless humeral head fixation configured for fixation to a flat cut proximal humeral surface, wherein the humeral head fixation includes a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a rotationally-stabilizing, non-intramedullary base extension protruding therefrom including multiple fins configured for impaction into a cancellous region of the cut humeral surface, wherein the base surface of the humeral head is configured to contact or substantially mate with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 2 (Cancelled)

Claim 3 (Cancelled)

Claim 4 (Previously presented): The apparatus of Claim 1, wherein said multiple intersecting fins form a cruciform shape.

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Claim 5 (Previously presented): The apparatus of Claim 1, wherein the shape of one or more of said multiple fins is plano-triangular.

Claim 6 (Previously presented): The apparatus of Claim 1, wherein the protruding base extension further includes at least one linear extension.

Claim 7 (Cancelled)

Claim 8 (Previously presented): A total shoulder arthroplasty apparatus for recreating an anatomic proximal humeral configuration, comprising:

a stemless humeral head fixation configured for fixation to a previously cut proximal humeral surface, wherein the humeral head fixation includes a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a non stem-bearing, stabilizing, non-intramedllary base extension including multiple fins protruding therefrom configured for impaction into a cancellous region of the cut humeral surface, wherein the base surface of the humeral head is configured to contact or substantially mate with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

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**Claim 9 (Original):** The apparatus of Claim 8, wherein the protruding base extension includes two or more linear extensions for rotational stabilization.

**Claim 10 (Previously presented):** The apparatus of any of Claims 1 or 8, wherein a periphery of the humeral head fixation is formed to match cortical margins of the cut humeral surface.

**Claim 11 (Previously presented):** The apparatus of any of Claims 1 or 8, wherein the humeral head fixation is configured to be attached to the humeral surface using an adhesive.

**Claim 12 (Original):** The apparatus of Claim 11, wherein the adhesive is surgical cement.

**Claim 13 (Previously presented):** The apparatus of any of Claims 1 or 8, wherein the humeral head fixation is configured to be attached to the humeral surface by press-fitting.

**Claim 14 (Previously presented):** The apparatus of any of Claims 1 or 8, wherein a periphery of the base of the humeral head fixation is formed to match a specific shape and size of the anatomic neck of a specific humeral surface.

**Claim 15 (Previously presented):** The apparatus of any of Claims 1 or 8, further comprising a template punch configured to be inserted into the cut humeral surface, wherein the base extension is a total or partial male complement to a female template punch.

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**Claim 16 (Previously presented):** A total shoulder arthroplasty apparatus for recreating an anatomic proximal humeral configuration, comprising:

a stemless humeral head fixation configured for fixation to a flat cut proximal humeral surface, wherein the humeral head fixation includes a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a rotationally-stabilizing, non-intramedullary base extension protruding therefrom including multiple fins configured for impaction into a cancellous, non-intramedullary region of the cut humeral surface, wherein the base surface of the humeral head is configured to contact or substantially mate with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

**Claim 17 (Previously presented):** The apparatus of Claim 16, wherein a periphery of the humeral head fixation is formed to match cortical margins of the cut humeral surface.

**Claim 18 (Previously presented):** The apparatus of Claim 16, wherein the humeral head fixation is configured to be attached to the humeral surface using an adhesive.

**Claim 19 (Original):** The apparatus of Claim 18, wherein the adhesive is surgical cement.

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Claim 20 (Previously presented): The apparatus of Claim 16, wherein the humeral head fixation is configured to be attached to the humeral surface by press-fitting.

Claim 21 (Previously presented): The apparatus of Claim 16, wherein a periphery of the base of the humeral head fixation is formed to match a specific shape and size of the anatomic neck of a specific humeral surface.

Claim 22 (Previously presented): The apparatus of Claim 16, further comprising a template punch configured to be inserted into the cut humeral surface, wherein the base extension is a total or partial male complement to a female template punch.

Claim 23 (Previously presented): A total shoulder arthroplasty apparatus for recreating an anatomic proximal humeral configuration, comprising:

a humeral head fixation configured for fixation to a flat cut proximal humeral surface, wherein the humeral head fixation includes a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a rotationally-stabilizing, non-intramedullary base extension protruding therefrom including multiple fins for impaction into a cancellous region of the cut humeral surface, and wherein the base extension is confined to protrude only into a ball region of the humerus, to which the humeral head is configured to couple, and which is above an elongate region of the humerus, wherein the base surface of the humeral head is configured to contact or substantially mate with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

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wherein the multiple fins are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 24 (Previously presented): A total shoulder arthroplasty apparatus for recreating an anatomic proximal humeral configuration, comprising:

a humeral head fixation configured for coupling to a cut proximal humeral surface, wherein the humeral head fixation includes a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a rotationally-stabilizing, non-intramedullary base extension protruding therefrom including multiple fins configured for impaction into a cancellous region of the cut humeral surface, and wherein the extension is nonintrusive of an elongate humeral region below a humeral ball region including the humeral head, wherein the base surface of the humeral head is configured to contact or substantially mate with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 25 (Currently amended): A total shoulder arthroplasty method for recreating an anatomic proximal humeral configuration, comprising the steps of:

preparing a stemless humeral head fixation having a humeral head including a base surface configured for cement or ingrowth fixation, or both, and

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a stabilizing, non-intramedullary base extension including multiple fins for efficient rotational stabilization of the humeral head fixation on a cut humeral surface configured for coupling with the cut humeral surface;

preparing a humeral surface for coupling the stemless ~~partial~~ humeral head fixation thereto, including cutting the humeral surface to reveal a cancellous interior; and

coupling the stemless ~~partial~~ humeral head fixation to the humeral surface including cement or ingrowth fixation of the humeral head with the humeral surface, thereby recreating the anatomic proximal humeral configuration, wherein the base surface of the partial humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 26 (Cancelled)

Claim 27 (Cancelled)

Claim 28 (Previously presented): The method of Claim 25, wherein the planar shape of the fins is triangular.

Claim 29 (Previously presented): The method of any of Claims 23-25, wherein said intersecting fins form a cruciform shape.

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Claim 30 (Previously presented): The method of Claim 25, wherein the protruding base extension further includes at least one linear extension.

Claim 31 (Previously presented): A total shoulder arthroplasty method for recreating an anatomic proximal humeral configuration, comprising the steps of:

preparing a stemless humeral head fixation having a humeral head including a base surface and a non stem-bearing, stabilizing, non-intramedullary base extension including multiple fins for rotational stabilization of the humeral head fixation on a cut humeral surface for coupling to the cut humeral surface;

preparing a humeral surface for coupling the humeral head fixation thereto, including cutting the humeral surface to reveal a cancellous interior; and

coupling the humeral head fixation to the humeral surface, thereby recreating the anatomic proximal humeral configuration, wherein the base surface of the partial humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 32 (Original): The method of Claim 31, wherein the base extension includes two or more linear extensions.

Claim 33 (Previously presented): The method of any of Claims 25 or 31, wherein the coupling step includes the step of impacting the base extension into

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the cancellous interior of the cut humeral surface, wherein the periphery of the humeral head fixation rests on the cortical margins of the humeral surface following the coupling.

Claim 34 (Previously presented): The method of any of Claims 25 or 31, wherein the coupling step includes the step of adhesively coupling the partial humeral head fixation to the humeral surface.

Claim 35 (Original): The method of Claim 34, wherein the adhesive is surgical cement.

Claim 36 (Previously presented): The method of any of Claims 25 or 31, wherein the coupling step includes the step of press-fitting the humeral head fixation to the humeral surface.

Claim 37 (Previously presented): The method of any of Claims 25 or 31, further comprising selecting a shape and size of the periphery of the base of the humeral head fixation from a variety of shapes and sizes for matching the specific shape and size of the anatomic neck of the cut humeral surface.

Claim 38 (Original): The method of any of Claims 25 or 31, further comprising the step of inserting a template punch into the cancellous of the cut humeral surface prior to performing the coupling step.

Claim 39 (Previously presented): The method of Claim 38, wherein the base extension is a total or partial male complement to a female template punch.

Claim 40 (Cancelled)

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Claim 41 (Previously presented): The method of any of Claims 25 and 31, wherein the coupling step includes impacting the base extension of the partial humeral head fixation nonintrusive to an elongate region of the humerus below a ball region of the humerus.

Claim 42 (Previously presented): A total shoulder arthroplasty method for recreating an anatomic proximal humeral configuration, comprising the steps of:

preparing a stemless humeral head fixation having a partial humeral head including a base surface and a non stem-bearing, stabilizing, non-intramedullary base extension including multiple fins for rotational stabilization of the humeral head on a cut humeral surface for coupling to the cut humeral surface;

preparing a humeral surface for coupling the humeral head fixation thereto, including cutting the humeral surface to reveal a cancellous interior; and

coupling the humeral head fixation to the humeral surface, thereby recreating the anatomic proximal humeral configuration, including impacting the base extension of the humeral head fixation to protrude only into a ball region of the humerus above an elongate region of the humerus, wherein the base surface of the partial humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

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**Claim 43 (Previously presented): A total shoulder arthroplasty method for recreating an anatomic proximal humeral configuration, comprising the steps of:**

- preparing a stemless humeral head fixation having a humeral head including a base surface and a non stem-bearing, stabilizing, non-intramedullary base extension including multiple fins for rotational stabilization of the humeral head fixation on a cut humeral surface for coupling to the cut humeral surface;**
- preparing a humeral surface for coupling the humeral head fixation thereto, including cutting the humeral surface to reveal a cancellous interior; and**
- coupling the humeral head fixation to the humeral surface including cement or ingrowth fixation, or both, of the humeral head with the humeral surface, thereby recreating the anatomic proximal humeral configuration, including impacting the base extension of the humeral head fixation nonintrusive to an elongate region of the humerus below a ball region of the humerus, wherein the base surface of the humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and**
- wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.**

**Claims 44-49 (Cancelled)**

**Claim 50 (Previously presented): A total shoulder arthroplasty method for recreating an anatomic proximal humeral configuration, comprising the steps of:**

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preparing a stemless humeral head fixation having a humeral head including a base surface configured for cement or ingrowth fixation, or both, and a non stem-bearing, stabilizing, non-intramedullary base extension including multiple fins for rotational stabilization of the humeral head fixation on a cut humeral surface configured for coupling to the cut humeral surface;

preparing a humeral surface for coupling the humeral head fixation thereto, including cutting the humeral surface to reveal a cancellous interior; and

coupling the humeral head fixation to the humeral surface including cement or ingrowth fixation, or both, of the humeral head with the humeral surface, thereby recreating the anatomic proximal humeral configuration, wherein the base surface of the humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 51 (Previously presented): The method of any of Claims 25, 31 or 42-43 wherein said step of preparing a humeral surface comprises the steps of:

surgically establishing an access to a humerus of a patient;  
coupling a guide to the humerus, wherein the humeral head remains exposed;  
positioning said guide to define a humeral surface; and

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removing said humeral head by cutting along said humeral surface defined by said guide, whereby a precise humeral surface is revealed for attaching an artificial humeral head fixation during said arthroplasty.

Claim 52 (Previously presented): The method of Claim 51, further comprising the step of aligning said humeral surface with a glenoid version guide.

Claim 53 (Cancelled)

Claim 54 (Previously presented): A method for performing a shoulder arthroplasty, comprising the steps of:

- surgically establishing an access to a humerus of a patient;
- coupling a guide to the humerus, wherein the humeral head remains exposed;
- positioning said guide to define a humeral surface;
- removing said humeral head by cutting along said humeral surface defined by said guide, whereby a precise humeral surface is revealed for attaching an artificial humeral head fixation during said arthroplasty;
- preparing for coupling to the cut humeral surface a stemless humeral head fixation having a humeral head including a base surface and a non stem-bearing, stabilizing, non-intramedullary base extension including multiple fins protruding therefrom for rotational stabilization of the humeral head fixation on a cut humeral surface; and
- coupling the humeral head fixation to the humeral surface, thereby recreating the anatomic proximal humeral configuration, wherein the base surface of the humeral head contacts or substantially mates with the cut humeral surface when coupled therewith and the non-intramedullary base extension is impacted into the cancellous region, and

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wherein the multiple fins are formed to have a cruciform shape and are uniformly planar along their entire extents and directly intersect at a center of the base surface, said center having a diameter that is approximately equal to a thickness of each of said fins, such that each said multiple planar fin protrudes radially along a plane from the center of the base surface where it intersects with each of the other fins.

Claim 55 (Previously presented): The method of Claim 54, further comprising the step of aligning said humeral surface with a glenoid version guide.

Claims 56 – 69 (cancelled)